



# Illinois Department of Transportation

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To: Anthony J. Quigley Attn: John Baczek

From: Jack A. Elston

By: Michael Brand

*MJB*

Subject: Pavement Design Approval

Date: November 18, 2019

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Route: US Route 30  
Section: 15-00277-01-BR  
County: Kane  
Limits: at Dauberman Road

Job No.: n/a  
Contract No.: Local Roads  
Target Letting: Nov 2020

We have reviewed the pavement design for the above referenced project which was submitted on October 7, 2019. The scope of this local roads project involves reconstructing US 30 to provide additional channelization and improvement of the intersection at Dauberman Road.

The pavement design resulted in an HMA option and a PCC option. The life cycle cost analysis of those options resulted in the HMA option being more than 10% less expensive.

In summary, the approved pavement design is as follows:

US Route 30 - Reconstruction

10" Full-Depth HMA Pavement w/ HMA Shoulders

12" Aggregate Subgrade Improvement

If you have any questions, please contact Mike Brand at (217) 782-7651.



# Illinois Department of Transportation

## Memorandum

To: Jack Elston

Attn: Michael Brand

From: Jose A. Dominguez

By: Ojas Patel

Subject: Pavement Analysis\*

Date: October 7, 2019

\*Route: US Route 30

Limits: at Dauberman Road

Section: 15-00277-01-BR

Current target: 11CY20

County: Kane

Contract No.: Local Roads

Job No.: N/A

We have completed the pavement analysis for the above captioned location. Review by the Central Office is required since the total pavement area for reconstruction exceeds 4,750 Square Yards. The following is the scope of the project:

***As part of a Local Roads project to improve the intersection of US 30 at Dauberman Road, reconstruction of US 30 to provide additional channelization.***

A 20-year pavement analysis was performed on the above segments. We recommend a mechanistic flexible pavement design based on the life cycle cost analysis which favors HMA pavement by 25.7%.

### **US 30**

Reconstruction

HMA Shoulder

10" Full Depth HMA<sup>1,3</sup>

2" Polymerized HMA Surface Course, Mix "E", IL-9.5, N70

8" HMA Base Course, IL-19.0, N70

12" Aggregate Subgrade Improvement<sup>2</sup>

J. Elston  
October 7, 2019  
Page Two

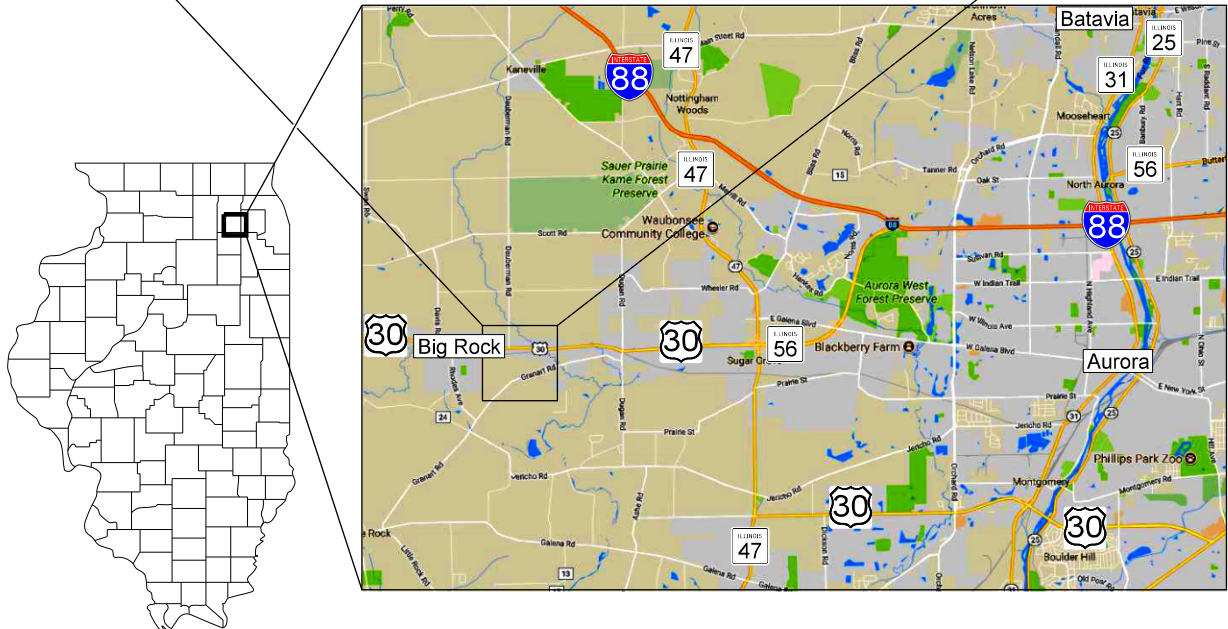
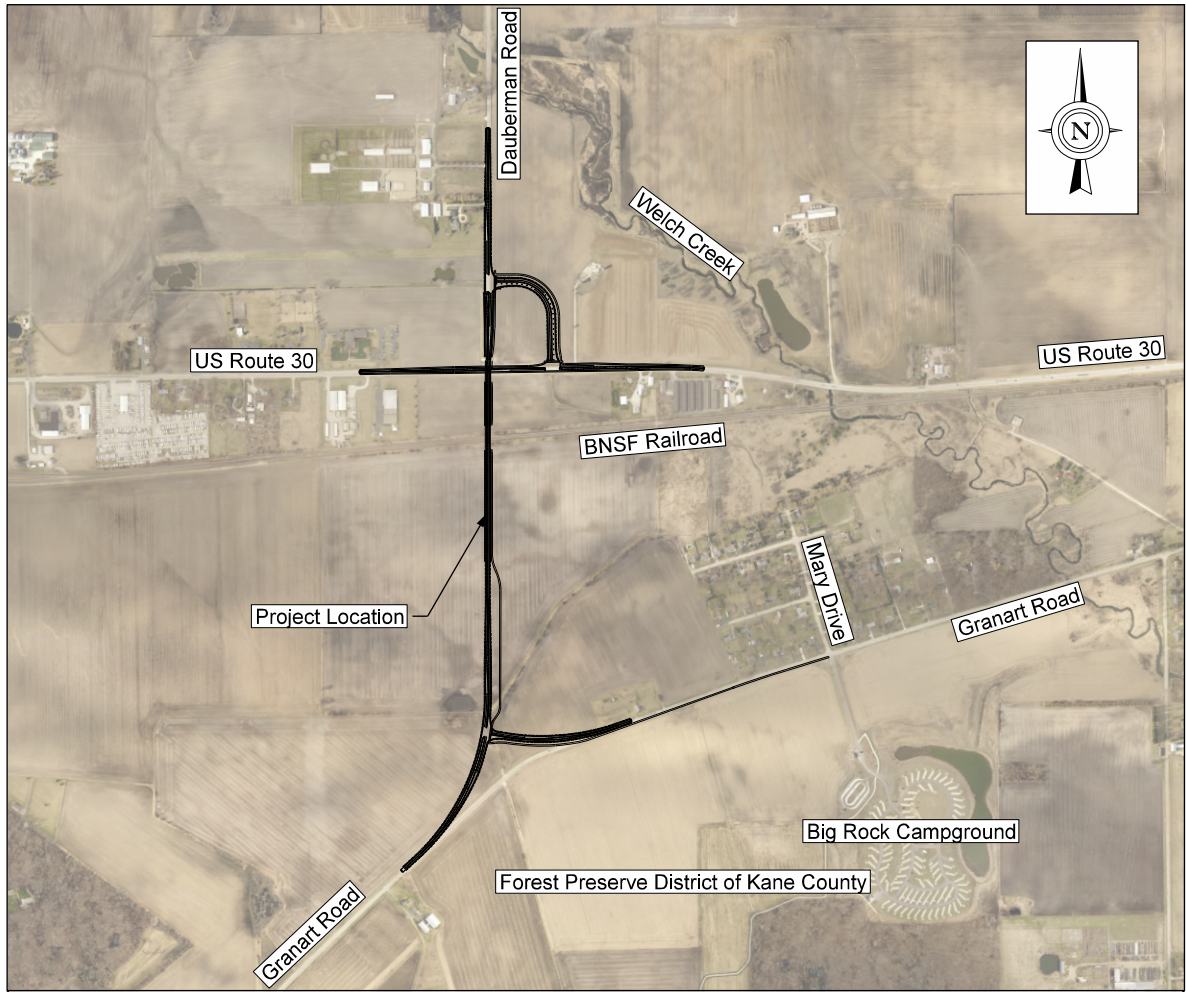
<sup>1</sup>Designer Note 1: Use pay item **40701881, HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 10"**, paid for in square yards.

<sup>2</sup>Designer Note 2: Use pay item **30300112, AGGREGATE SUBGRADE IMPROVEMENT, 12"**, paid in square yards.

<sup>3</sup>Designer Note 3: Refer to the District One, Bureau of Materials' "Hot-Mix Asphalt – Mix Selection" tables to determine the corresponding HMA mix table requirements for the plans.

If you have any questions or need additional information, please contact Ojas Patel, Pavement Design Engineer, at (847)705-4550.

By:   
Jose A. Dominguez, P.E.  
Project Support Engineer



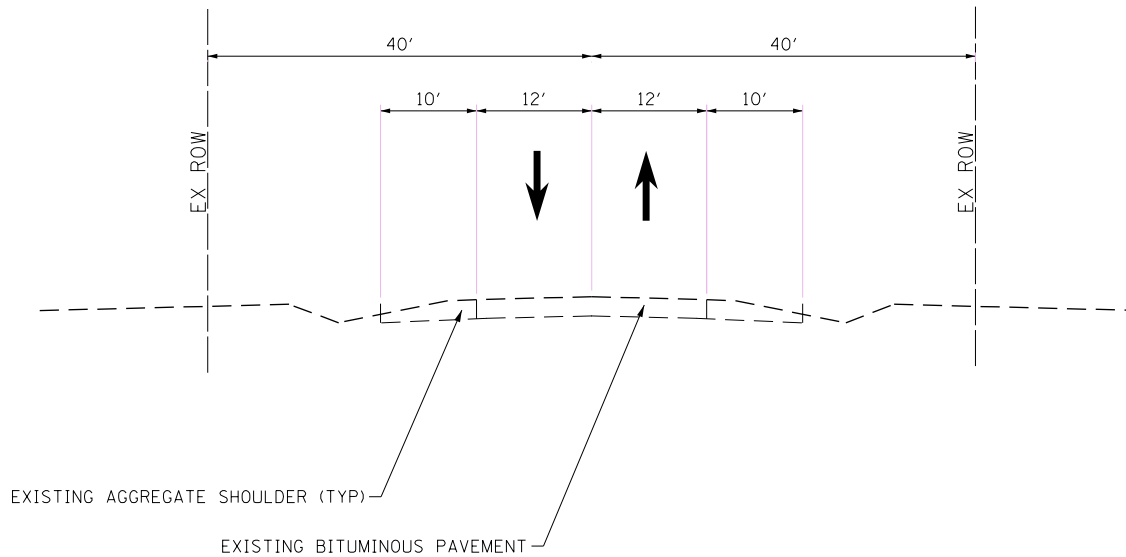
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PLOT SCALE = \$SCALE\$
PLOT DATE = \$DATE\$

### Project Location and Limits Map

F.A.S RTE.	SECTION	COUNTY	APPX	EXHIBIT	SHEET
1107	15-00277-01-BR	KANE	A	1	1 OF 1
Dauberman Road Extension Project Development Report Project Location and Limits Map					



US ROUTE 30



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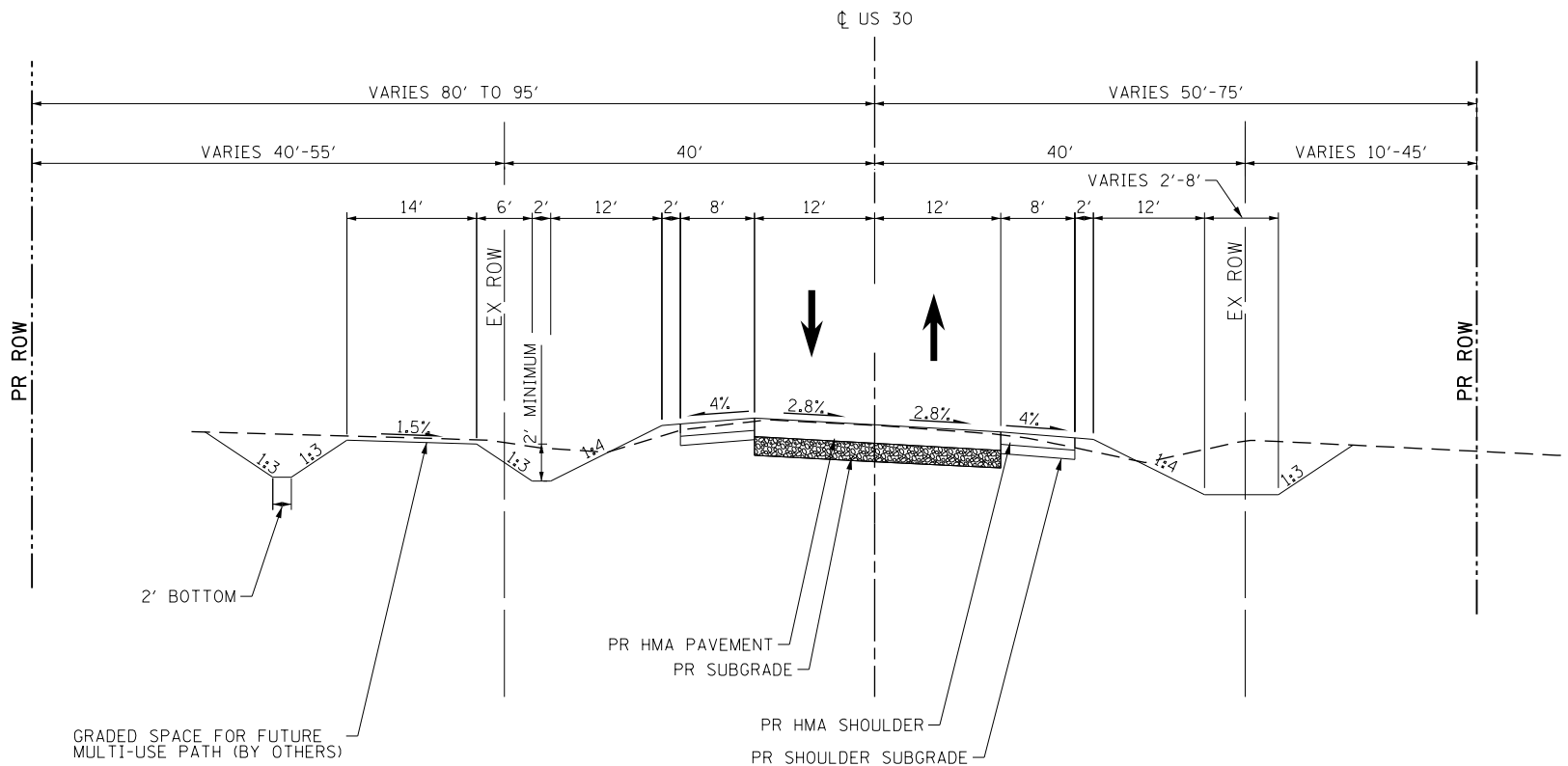
Kane County  
Division of Transportation

EXISTING  
TYPICAL SECTION

F.A.S RTE.	SECTION	COUNTY	APPX	EXHIBIT	SHEET
1107	15-00277-01-BR	KANE	A	2	2
Dauberman Road Extension Project Development Report					



FILE NAME = p:\hqr\print\011e-etran\transcorp\p4\Documents\Projects\CH401 - Chicago P401150086 - Kane County - Dauberman Road Extension\303.00 - Road\303.02 - Exhibits\14- PDR Exhibits\0086-PDR-AppA.00



US ROUTE 30  
SUPERELEVATION: STA. 360+85.74 TO 366+86.84

ILLINOIS DEPARTMENT  
OF TRANSPORTATION

PROPOSED  
TYPICAL SECTION

F.A.S RTE.	SECTION	COUNTY	APPX	EXHIBIT	SHEET
1107	15-00277-01-BR	KANE	A	8	5
Dauberman Road Extension Project Development Report					

USER NAME = mbmawhorter

PLOT SCALE = 20,000' / in.

PLOT DATE = 12/1/2017



## PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: <b>US 30</b>	Comments: <b>Local Roads project improving the intersection of US 30 at Dauberman Rd</b>									
Section: <b>15-00277-01-BR</b>										
County: <b>Kane</b>	Design Date: <b>09/24/2019</b> <b>ONP</b>									
Location: <b>at Dauberman Road</b>	Modify Date: <b>11/05/2019</b> <b>ONP</b>									
Facility Type: <b>Other Marked State Route</b>	<table border="1"> <tr> <td>&lt;-- BY</td> <td>ADT</td> <td>Year</td> </tr> <tr> <td>Current:</td> <td><b>10,900</b></td> <td><b>2020</b></td> </tr> <tr> <td>Future:</td> <td><b>15,000</b></td> <td><b>2040</b></td> </tr> </table>	<-- BY	ADT	Year	Current:	<b>10,900</b>	<b>2020</b>	Future:	<b>15,000</b>	<b>2040</b>
<-- BY	ADT	Year								
Current:	<b>10,900</b>	<b>2020</b>								
Future:	<b>15,000</b>	<b>2040</b>								
# of Lanes = <b>2 or 3</b>										
Part of future 4 lanes or more ? <b>No</b>										
One Way Street ? <b>No</b>										
Road Class: <b>II</b>										
Subgrade Support Rating (SSR): <b>Poor</b>										
Construction Year: <b>2020</b>										
Design Period (DP) = <b>20</b> years										

Structural Design Traffic			
Minimum ADT	Actual ADT	Actual % of Total ADT	% of ADT in Design Lane
PV = <b>0</b>	11,914	92.0%	P = <b>50%</b>
SU = <b>250</b>	518	<b>4.0%</b>	S = <b>50%</b>
MU = <b>750</b>	518	<b>4.0%</b>	M = <b>50%</b>
Struct. Design ADT = <b>12,950</b>		(2030)	

FLEXIBLE PAVEMENT		RIGID PAVEMENT	
Cpv = 0.15		Cpv = 0.15	
Csu = <b>112.06</b>		Csu = <b>135.78</b>	
Cmu = <b>385.44</b>		Cmu = <b>567.21</b>	
TF flexible (Actual) = 2.59	(Actual ADT)	TF rigid (Actual) = 3.66	(Actual ADT)
TF flexible (Min) = 3.17	(Min ADT Fig. 54-2.C)	TF rigid (Min) = 4.59	(Min ADT Fig. 54-2.C)

## TRAFFIC FACTOR CALCULATION

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS			
Full-Depth HMA Pavement		JPC Pavement	
Use TF flexible = 3.17		Use TF rigid = 4.59	
PG Grade Lower Binder Lifts = <b>PG 64-22</b> (Fig. 53-4.R)		Edge Support = <b>Tied</b> Shoulder or C.&G.	
HMA Mixture Temp. = <b>75.0</b> deg. F (Fig. 54-5.C)		<b>Rigid Pavt Thick. = 9.00 in. (Fig. 54-4.E)</b>	
Design HMA Mixture Modulus (E <sub>HMA</sub> ) = 690 ksi (Fig. 54-5.D)			
Design HMA Strain (ε <sub>HMA</sub> ) = 86 (Fig. 54-5.E)			
Full Depth HMA Design Thickness = 10.00 in. (Fig. 54-5.F)			
Limiting Strain Criterion Thickness = <b>14.75</b> in. (Fig. 54-5.I)			
<b>Use Full-Depth HMA Thickness = 10.00 inches</b>		<b>CRCP Thickness = 7.75 in. (Fig. 54-4.N)</b>	
<b>TF MUST BE &gt; 60 FOR CRCP</b>			

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS			
HMA Overlay of Rubblized PCC		Unbonded Concrete Overlay	
Use TF flexible = 3.17		Review 54-4.03 for limitations and special considerations.	
HMA Overlay Design Thickness = 7.25 in. (Fig. 54-5.U)			
Limiting Strain Criterion Thickness = in. (Fig. 54-5.V)			
<b>Use HMA Overlay Thickness = 999.00 inches</b>		<b>JPCP Thickness = NA inches</b>	
<b>CONTACT BMPR FOR ASSISTANCE</b>			

DESIGN TABLES FROM BDE MANUAL CHAPTER 54 - PAVEMENT DESIGN							
Class I Roads		Class II Roads		Class III Roads		Class IV Roads	
4 lanes or more		2 lanes with ADT > 2000		2 Lanes		2 Lanes	
Part of a future 4 lanes or more		One way Street with ADT <= 3500		(ADT 750 -2000)		(ADT < 750)	
One-way Streets with ADT > 3500							
		Min. Str. Design Traffic (Fig 54-2.C)					
Facility Type		PV	SU	MU	Class Table for One-Way Streets		
Interstate or Freeway		0	500	1500	ADT Class		
Other Marked State Route		0	250	750	0 - 3500 <b>II</b>		
Unmarked State Route		No Min	No Min	No Min	>3501 <b>I</b>		
		Traffic Factor ESAL Coefficients					
		Rigid (Fig. 54-4.C)		Flexible (Fig. 54-5.B)			
Class		Csu	Cmu	Csu	Cmu	Class Table for 2 or 3 lanes (not future 4 lane & not one-way street)	
I		143.81	696.42	132.50	482.53	ADT Class	
II		135.78	567.21	112.06	385.44	0 - 749 <b>IV</b>	
III		129.58	562.47	109.14	384.35	750 - 2000 <b>III</b>	
IV		129.58	562.47	109.14	384.35	>2000 <b>II</b>	
		Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.B)					
		Rural			Urban		
Number of Lanes		P	S	M	P	S	M
1 Lane Ramp		100%	100%	100%	100%	100%	100%
2 or 3		50%	50%	50%	50%	50%	50%
4		32%	45%	45%	32%	45%	45%
6 or more		20%	40%	40%	8%	37%	37%



**LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION****FULL-DEPTH HMA PAVEMENT**

Standard Design

ROUTE US 30  
SECTION 15-00277-01-BR  
COUNTY Kane  
LOCATION at Dauberman Road

FACILITY TYPE NON-INTERSTATE

PROJECT LENGTH 2690 FT ==> 0.51 Miles  
# OF CENTERLINES 2 CL  
# OF LANES 3 LANES  
# OF EDGES 2 EP  
LANE WIDTH - AVERAGE 12 FT  
SHOULDER WIDTH HMA Left 8 FT  
HMA Right 8 FT  
Total Width of Paved Shoulders 16 FT

PAVEMENT THICKNESS (FLEXIBLE) 10.00 IN 14.75 IN MAX  
SHOULDER THICKNESS 8.00 IN Standard Design  
POLICY OVERLAY THICKNESS 2.25 IN

FLEX PAVEMENT	TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
		3.17	2.59	3.17

Read Me!

HMA COST PER TON	UNIT PRICE
HMA SURFACE	\$89.40 / TON
HMA TOP BINDER	\$79.30 / TON
HMA LOWER BINDER	\$79.30 / TON
HMA BINDER (LEVELING)	\$85.00 / TON
HMA SHOULDER	\$72.00 / TON

**INITIAL COSTS**

ITEM	THICKNESS	100% QUANTITY UNIT	UNIT PRICE	COST
HMA PAVEMENT ( FULL-DEPTH )	( 10.00" )	10,760 SQ YD	\$46.00 / SQ YD	\$494,960
HMA SURFACE COURSE	( 2.00" )	1,211 TONS	\$89.40 / TON	\$0
HMA TOP BINDER COURSE	( 2.25" )	1,375 TONS	\$79.30 / TON	\$0
HMA LOWER BINDER COURSE	( 5.75" )	3,579 TONS	\$79.30 / TON	\$0
HMA SHOULDER	( 8.00" )	2,142 TONS	\$72.00 / TON	\$154,255
CURB & GUTTER		0 LIN FT	\$30.00 / LIN FT	\$0
SUBBASE GRAN MATL TY C (TONS)		128 TONS	\$25.00 / TON	\$3,200
IMPROVED SUBGRADE:	Aggregate	16,339 SQ YD	\$15.00 / SQ YD	\$245,085
Reserved For User Supplied Item		0 UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item		0 UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL		10,760 SQ YD	\$10.00 / SQ YD	\$107,600
SHOULDER REMOVAL		4,782 SQ YD	\$15.00 / SQ YD	\$71,730

Note: \* Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST \$1,076,830  
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE \$86,205

**MAINTENANCE COSTS:**

ITEM	THICKNESS	MATERIAL	UNIT COST
ROUTINE MAINTENANCE ACTIVITY			\$0.00 LANE-MILE / YEAR
HMA OVERLAY PVMT SURF	( 2.00" )	Surface Mix	\$10.06 / SQ YD
HMA OVERLAY PVMT	( 2.25" )	Surface Mix	\$11.14 / SQ YD
HMA SURFACE MIX	( 1.50" )	Surface Mix	\$7.54 / SQ YD
HMA BINDER MIX	( 0.75" )	iling Binder Mix	\$3.80 / SQ YD
HMA OVERLAY SHLD (Year 30)	( 2.25" )	Shoulder Mix	\$9.07 / SQ YD
HMA OVERLAY SHLD	( 2.00" )	Shoulder Mix	\$8.06 / SQ YD
MILLING (2.00 IN)			\$5.00 / SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill Surf)	Surface Mix	\$82.01 / SQ YD
PARTIAL DEPTH SHLD PATCH	(Mill & Fill Surf)	Shoulder Mix	\$80.06 / SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill +2.00")	Leveling Binder Mix	\$81.52 / SQ YD
PARTIAL DEPTH SHLD PATCH	(Mill & Fill +2.00")	Shoulder Mix	\$80.06 / SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL			\$2.00 / LIN FT
CENTERLINE JOINT ROUT & SEAL			\$2.00 / LIN FT
RANDOM / THERMAL CRACK ROUT & SEAL	(100% Rehab = 110.00' / Station / Lane)		\$2.00 / LIN FT

FLEXIBLE TOTAL LIFE-CYCLE COST \$1,443,327  
FLEXIBLE TOTAL ANNUAL COST PER MILE \$115,544

FULL-DEPTH HMA PAVEMENT  
HMA OVERLAY OF RUBBLIZED PCC PAVEMENT  
Figure 54-7.C  
STANDARD DESIGN

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH
YEAR 5	LONG SHLD JT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	CNTR LINE JOINT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	RNDM / THRM CRACK R&S	50.00%	4,439	LIN FT	\$2.00	\$8,878	
	PD PVMT PATCH M&F SURF	0.10%	11	SQ YD	\$82.01	\$902	
	PWFn =	0.8626		PW =	0.8626 X	\$31,300	\$27,000
YEAR 10	LONG SHLD JT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	CNTR LINE JOINT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	RNDM / THRM CRACK R&S	50.00%	4,439	LIN FT	\$2.00	\$8,878	
	PD PVMT PATCH M&F SURF	0.50%	54	SQ YD	\$82.01	\$4,429	
	PWFn =	0.7441		PW =	0.7441 X	\$34,827	\$25,915
YEAR 15	MILL PVMT & SHLD 2.00"	100.00%	15,542	SQ YD	\$5.00	\$77,710	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	108	SQ YD	\$81.52	\$8,804	
	HMA OVERLAY PVMT 2.00"	100.00%	10,760	SQ YD	\$10.06	\$108,237	
	HMA OVERLAY SHLD 2.00 "	100.00%	4,782	SQ YD	\$8.06	\$38,564	
	PWFn =	0.6419		PW =	0.6419 X	\$233,315	\$149,756
YEAR 20	LONG SHLD JT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	CNTR LINE JOINT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	RNDM / THRM CRACK R&S	50.00%	4,439	LIN FT	\$2.00	\$8,878	
	PD PVMT PATCH M&F SURF	0.10%	11	SQ YD	\$82.01	\$902	
	PWFn =	0.5537		PW =	0.5537 X	\$31,300	\$17,330
YEAR 25	LONG SHLD JT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	CNTR LINE JOINT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	RNDM / THRM CRACK R&S	50.00%	4,439	LIN FT	\$2.00	\$8,878	
	PD PVMT PATCH M&F SURF	0.50%	54	SQ YD	\$82.01	\$4,429	
	PWFn =	0.4776		PW =	0.4776 X	\$34,827	\$16,634
HMA SD							
YEAR 30	NON-INTERSTATE						
	MILL PVMT & SHLD 2.00"	100.00%	15,542	SQ YD	\$5.00	\$77,710	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	215	SQ YD	\$81.52	\$17,527	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	48	SQ YD	\$80.06	\$3,843	
	HMA OVERLAY PVMT 2.25 "	100.00%	10,760	SQ YD	\$11.14	\$119,831	
	HMA OVERLAY SHLD 2.25 "	100.00%	4,782	SQ YD	\$9.07	\$43,384	
	PWFn =	0.4120		PW =	0.4120 X	\$262,295	\$108,062
YEAR 35	LONG SHLD JT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	CNTR LINE JOINT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	RNDM / THRM CRACK R&S	50.00%	4,439	LIN FT	\$2.00	\$8,878	
	PD PVMT PATCH M&F SURF	0.10%	11	SQ YD	\$82.01	\$902	
	PWFn =	0.3554		PW =	0.3554 X	\$31,300	\$11,124
YEAR 40	LONG SHLD JT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	CNTR LINE JOINT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	RNDM / THRM CRACK R&S	50.00%	4,439	LIN FT	\$2.00	\$8,878	
	PD PVMT PATCH M&F SURF	0.50%	54	SQ YD	\$82.01	\$4,429	
	PWFn =	0.3066		PW =	0.3066 X	\$34,827	\$10,676
							\$366,497
ROUTINE MAINTENANCE ACTIVITY				1.53 Lane Miles	0.00	\$0	\$0
							MAINTENANCE LIFE-CYCLE COST \$366,497
45	YEAR LIFE CYCLE	CRFn = 0.0407852					MAINTENANCE ANNUAL COST PER MILE \$29,340

**PCC PAVEMENT****JPCP**

ROUTE US 30  
 SECTION 15-00277-01-BR  
 COUNTY Kane  
 LOCATION at Dauberman Road

FACILITY TYPE NON-INTERSTATE

PROJECT LENGTH 2690 FT ==> 0.51 Miles  
 # OF CENTERLINES 2 CL  
 # OF LANES 3 LANES  
 # OF EDGES 2 EP  
 LANE WIDTH - AVERAGE 12 FT  
 SHOULDER WIDTH PCC Left 8 FT  
 PCC Right 8 FT  
 Total Width of Paved Shoulders 16 FT

PAVEMENT THICKNESS (RIGID) JPCP 9.00 IN TIED SHLD  
 SHOULDER THICKNESS 9.00 IN

POLICY OVERLAY THICKNESS 2.50 IN

RIGID PAVEMENT	TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
		4.59	3.66	4.59
Worksheet Construction Type is	Reconstruction		The Pavement Type is	JPCP

**INITIAL COSTS**

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
JPC PAVEMENT	( 9.00" )	10,760	SQ YD	\$65.31 / SQ YD	\$702,736
PAVEMENT REINFORCEMENT		0	SQ YD	\$22.00 / SQ YD	\$0
STABILIZED SUBBASE	( 4.00" )	11,657	SQ YD	\$19.00 / SQ YD	\$221,483
PCC SHOULDERS		4,782	SQ YD	\$50.00 / SQ YD	\$239,100
CURB & GUTTER		0	LIN FT	\$30.00 / LIN FT	\$0
SUBBASE GRAN MATL TY C	( ~ 1.00" )	583	TONS	\$25.00 / TON	\$14,575
IMPROVED SUBGRADE:	Aggregate	15,841	SQ YD	\$15.00 / SQ YD	\$237,615
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL		10,760	SQ YD	\$10.00 / SQ YD	\$107,600
SHOULDER REMOVAL		4,782	SQ YD	\$15.00 / SQ YD	\$71,730

Note: \* Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST	\$1,594,839
RIGID CONSTRUCTION ANNUAL COST PER MILE	\$127,674

**MAINTENANCE COSTS:**

ITEM	THICKNESS	MATERIAL	UNIT COST
ROUTINE MAINTENANCE ACTIVITY			\$0.00 / LANE-MILE / YEAR
HMA POLICY OVERLAY	( 2.50" )		\$0.00
HMA POLICY OVERLAY PVMT	( 2.50" )		\$12.34 / SQ YD
HMA SURFACE MIX	( 1.50" )	Surface Mix	\$7.54 / SQ YD
HMA BINDER MIX	( 1.00" )	aling Binder Mix	\$4.80 / SQ YD
HMA POLICY OVERLAY SHLD	( 2.50" )	Shoulder Mix	\$10.08 / SQ YD
CLASS A PAVEMENT PATCHING			\$195.00 / SQ YD
CLASS B PAVEMENT PATCHING			\$150.00 / SQ YD
CLASS C SHOULDER PATCHING			\$145.00 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA Surf)		Surface Mix	\$79.51 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")		Surface Mix	\$84.52 / SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL			\$2.00 / LIN FT
CENTERLINE JOINT ROUT & SEAL			\$2.00 / LIN FT
REFLECTIVE TRANSVERSE CRACK ROUT & SEAL			\$2.00 / LIN FT
RANDOM CRACK ROUT & SEAL	(100% Rehab = 100.00' / Station / Lane)		\$2.00 / LIN FT

RIGID TOTAL LIFE-CYCLE COST	\$1,789,786
RIGID TOTAL ANNUAL COST PER MILE	\$143,280

JOINTED PLAIN CONCRETE PAVEMENT  
UNBONDED JOINTED PLAIN CONCRETE OVERLAY  
Figure 54-7.A

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH
YEAR 10	PAVEMENT PATCH CLASS B	0.10%	11	SQ YD	\$150.00	\$1,650	
	PWF <sub>n</sub> =	0.7441			PW =	0.7441 X	\$1,228
YEAR 15	PAVEMENT PATCH CLASS B	0.20%	22	SQ YD	\$150.00	\$3,300	
	PWF <sub>n</sub> =	0.6419			PW =	0.6419 X	\$2,118
YEAR 20	PAVEMENT PATCH CLASS B	2.00%	215	SQ YD	\$150.00	\$32,250	
	SHOULDER PATCH CLASS C	0.50%	24	SQ YD	\$145.00	\$3,480	
	LONGITUDINAL SHLD JT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	CENTERLINE JT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	PWF <sub>n</sub> =	0.5537			PW =	0.5537 X	\$31,698
YEAR 25	PAVEMENT PATCH CLASS B	3.00%	323	SQ YD	\$150.00	\$48,450	
	SHOULDER PATCH CLASS C	1.00%	48	SQ YD	\$145.00	\$6,960	
	PWF <sub>n</sub> =	0.4776			PW =	0.4776 X	\$26,464
YEAR 30	NON-INTERSTATE						
	PAVEMENT PATCH CLASS B	4.00%	430	SQ YD	\$150.00	\$64,500	
	SHOULDER PATCH CLASS C	1.50%	72	SQ YD	\$145.00	\$10,440	
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	10,760	SQ YD	\$12.34	\$132,776	
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	4,782	SQ YD	\$10.08	\$48,205	
	PWF <sub>n</sub> =	0.4120			PW =	0.4120 X	\$105,436
YEAR 35	NON-INTERSTATE						
	LONGITUDINAL SHLD JT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	CENTERLINE JT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	RANDOM CRACK R&S	50.00%	4,035	LIN FT	\$2.00	\$8,070	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	2,578	LIN FT	\$2.00	\$5,156	
	PD PVMT PATCH M&F HMA 2.50"	0.10%	11	SQ YD	\$84.52	\$930	
	PWF <sub>n</sub> =	0.3554			PW =	0.3554 X	\$12,679
YEAR 40	NON-INTERSTATE						
	PAVEMENT PATCH CLASS B	0.50%	54	SQ YD	\$150.00	\$8,100	
	LONGITUDINAL SHLD JT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	CENTERLINE JT R&S	100.00%	5,380	LIN FT	\$2.00	\$10,760	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	3,866	LIN FT	\$2.00	\$7,732	
	RANDOM CRACK R&S	50.00%	4,035	LIN FT	\$2.00	\$8,070	
	PD PVMT PATCH M&F HMA 2.50"	0.50%	54	SQ YD	\$84.52	\$4,564	
	PWF <sub>n</sub> =	0.3066			PW =	0.3066 X	\$15,324
							\$194,947
	ROUTINE MAINTENANCE ACTIVITY		1.53	Lane Miles	\$0.00	\$0	\$0
							MAINTENANCE LIFE-CYCLE COST \$194,947
45	YEAR LIFE CYCLE	CRF <sub>n</sub> = 0.0407852					MAINTENANCE ANNUAL COST PER MILE \$15,606

**LIFE-CYCLE COST ANALYSIS: NEW DESIGN**

Calculated / Revised : 10/7/19 1:41 PM

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	\$1,594,839	\$1,076,830
		ANNUAL COST PER MILE	\$127,674	\$86,205
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	\$194,947	\$366,497
		ANNUAL COST PER MILE	\$15,606	\$29,340
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	\$1,789,786	\$1,443,327
		ANNUAL COST PER MILE	\$143,280	\$115,544

**LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY**

LOWEST COST OPTION	=====>	HMA	\$115,544	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	JPCP	\$143,280	24.0%

S:\GEN\WPDOCS\Pavement Designs\D-1\US 30 at Dauberman Rd - Local Roads\US 30-IDOT Mech Pvmnt Dgn LCCA - Revised Nov 2019.xlsm]LifeCycleCost